

A1
cont

a barrier layer formed between the insulation film and the interconnection material; and
an adhesion layer containing zirconium formed between the insulation film and the barrier layer, the adhesion layer being for improving an adhesion between the insulation film and the barrier layer.

Sub B

5. (Amended) A metal interconnection buried in an insulation film comprising:
an interconnection material containing copper as a main component;
a barrier layer formed between the insulation film and the interconnection material;
and
an adhesion layer containing a metal material having a solid solubility limit of not more than 20 wt% in copper and a resistivity increase of not more than 19.8% when solved in copper, the adhesion layer being for improving an adhesion between the barrier layer and the interconnection material.

2

6. (Amended) A semiconductor device comprising:
a base substrate having a semiconductor substrate and a semiconductor element formed on the semiconductor substrate;
an insulation film formed on the base substrate, the insulation film having an opening;
and
a metal interconnection formed buried in the opening including:
a metal interconnection material containing copper as a main component;
a barrier layer formed between the insulation film and the interconnection material; and
an adhesion layer containing zirconium formed between the barrier layer and the interconnection material, the adhesion layer being for improving an adhesion between the barrier layer and the interconnection material.

A²
Cont

7. (Amended) A semiconductor device comprising:
a base substrate having a semiconductor substrate and a semiconductor element formed on the semiconductor substrate;
an insulation film formed on the base substrate, the insulation film having an opening;
and
a metal interconnection formed buried in the opening including:
a metal interconnection material containing copper as a main component;
a barrier layer formed between the insulation film and the interconnection material; and
an adhesion layer containing zirconium formed between the insulation film and the barrier layer, the adhesion layer being for improving an adhesion between the insulation film and the barrier layer.

for (B)

3
A

14. (Amended) A method for forming a metal interconnection buried in an insulation film, comprising the steps of:
forming a barrier layer on the insulation film;
forming an adhesion layer containing zirconium directly on the barrier layer; and
forming an interconnection material containing copper as a main component on the adhesion layer.

15. (Amended) A method for forming a metal interconnection buried in an insulation film, comprising the steps of:
forming an adhesion layer containing zirconium on the insulation film;
forming a barrier layer directly on the adhesion layer; and
forming an interconnection material containing copper as a main component on the barrier layer.

17. (Amended) A method for fabricating a semiconductor device comprising the steps of:

forming an insulation film on the base substrate having a semiconductor substrate and a semiconductor element formed on the semiconductor substrate;

selectively removing the insulation film to form an opening in the insulation film;

forming a barrier layer on the insulation film and a region where the opening is formed;

forming a first adhesion layer containing zirconium directly on the barrier layer;

forming an interconnection material containing copper as a main component on the first adhesion layer so as to fill the opening; and

removing the interconnection material, the first adhesion layer and the barrier layer by polishing the same until the insulation film is exposed to form the metal interconnection of the interconnection material, the first adhesion layer and the barrier layer buried in the opening

22. (Amended) A method for fabricating a semiconductor device comprising the steps of:

forming an insulation film on the base substrate having a semiconductor substrate and a semiconductor element formed on the semiconductor substrate;

selectively removing the insulation film to form an opening in the insulation film;

forming an adhesion layer containing zirconium on the insulation film and a region where the opening is formed;

forming a barrier layer directly on the adhesion layer;

forming an interconnection material containing copper as a main component on the barrier layer so as to fill the opening; and

removing the interconnection material, the barrier layer and the adhesion layer by polishing the same until the insulation film is exposed to form the metal interconnection of the interconnection material, barrier layer and the adhesion layer buried in the opening;